

REMARKS

On January 5, 2006, the Examiner rejected Claim 1 under 35 U.S.C. § 112, as failing to comply with the written description requirement. Claims 2-11, 13, 14, 16-24, 26, 46 and 48 were rejected as being obvious in view of Urban, Ufer, Douglas, Pace and Diebold. Claims 12 and 25 were rejected as being obvious in view of Urban, Ufer, Douglas, Pace, Diebold and further in view of Wolf. Claims 15, 27, 47 and 49 were rejected as being obvious over Urban in view of Pace and Diebold. Claims 28 and 50 were rejected as being anticipated by Urban. In response, Applicant has amended independent Claim 1 to comply with § 112, amended independent Claims 2 and 15, amended dependent Claims 17-26, and canceled Claims 16, 27, 28, and 46-50. Claim 2 and 15 were rejected as being obvious over Urban in view of other patents. Applicant has amended independent claims 2 and 15 to more clearly distinguish them from Urban. Nothing in the other cited prior art patents suggest that when combined with Urban would teach the present invention.

Regarding Claim 1, the Examiner notes he could not find support for Claim 1's requirement that the analyte selective materials be suspended such that they do not come in contact with the submicroelectrodes. Claim 1 has been amended to claim that the analyte binding materials are suspended over the cavity opening such that they do not come in contact with the wall and bottom electrodes. This limitation is adequately supported by the specification, and Applicant believes Claim 1 as amended is now in condition for allowance.

Regarding Claims 2 and 15, the other independent claims, were rejected as obvious over Urban in view of several other patents. Applicant has amended both these independent claims to more clearly distinguish them from the cited references. Nothing in the cited patents may be combined with Urban to suggest modifying Urban to disclose the present invention.

First, the Examiner appears to over interpret the use of the polyimide in the Urban patent. Those skilled in the art appreciate that there are two distinct forms of polyimide, each intended for a different fabrication purpose. Urban does mention polyimide as one possibility for an “insulating layer.” An insulation layer is one that is placed between the conducting layers, and as such, it cannot act as a “substrate.” In order for polyimide to serve as an insulation layer, it is likely deposited as a polymer solution and then allowed to dry or cure and is not considered flexible. The second form of polyimide, not the type alluded to in Urban, is “free-standing,” and is the only type of polyimide that can serve as a flexible substrate. The free-standing polyimide cannot easily be used as an insulator between conducting layers in a multilayer device, because this would require the free-standing polyimide to be first modified with conducting layers on both sides, which is then repeated. Then, one side of this two-conducting-layer-modified free-standing polyimide would have to be adhered to the substrate to form a good seal, which is a difficult task. Given the lack of disclosure by Urban for a method of producing such a layer, it can only be assumed that Urban did not intend that there be a flexible substrate for the device disclosed in the patent. If Urban did intend the insulation layer to be composed of the flexible, free-standing polyimide, then those skilled in the art would find it unlikely that the “surface of the inactive separation sector is small when compared to the surface of the active electrode segment” as in Claim 4 of Urban. This is because flexible, free-standing polyimide is fairly thick (several 100 micrometers) in comparison to solution-deposited polyimide (a few micrometers). Thus, Urban did not intend for the polyimide insulation layer to be the same as a flexible substrate.

Additionally, Urban makes it clear that the intent for the “internal electrode” is that it is completely surrounded by insulator exactly as shown in Figures 10 - 13. Unlike the present invention, Urban’s centrally located electrode is not intended to extend across the entire base of the

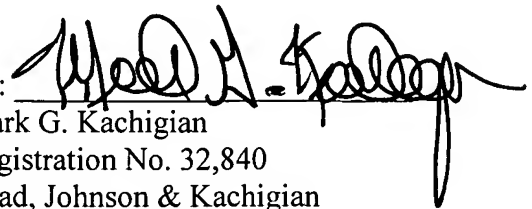
microcavity and under the overlaying insulator layer. In fact, Urban specifically states on page 18 that “electrode 1 is concentrically surrounded by the insulation layer 4 on an inert carrier 5.” “Concentrically surrounded” means surrounded on all edges of the electrode, and thus cannot be concentrically circled if its conducting layer extends beyond and under the insulating layer. The reason for Urban to avoid having the electrode layer lie under the insulating layer is to reduce noise problems and is the main basis of the patent. Thus, it is obvious to those skilled in the art that an electrode layer that extends across the entire bottom of the microcavity is not covered by the Urban patent.

Finally, Urban discloses electrodes that are planar and bands and that the recessed microdisk electrode is located only at the middle of the bottom of the microcavity. The present invention discloses an electrochemical sensing devices, within a microcavity. In the present invention, the microdisk electrode covers the entire bottom of the microcavity, the middle layer electrode is a hollow tubular nanoband electrode that is in the shape of a wedding band ring, while the top electrode consists of a tubular nanoband electrode that extends to the surface of the microcavity. Further, the diameter of the opening of the microcavity is the same as the diameter of the bottom of microcavity. And again, the recessed microdisk of the present invention is created out of a layer that has been deposited to cover the entire substrate, such that after creating the microcavity through the alternating conducting and insulating layers, the microdisk electrode covers the entire bottom of the microcavity.

Enclosed is a Request for a Two-Month Extension of Time and a check in the amount of \$225.00 to cover such filing fees.

For all the above stated reasons, Applicant believes that the application should be in condition for allowance and such action is earnestly solicited. If, for some reason, any other issues remain, a telephone conference with the Examiner is respectfully requested.

Respectfully Submitted

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